Pete Petri
2186 Jackson Keller #433
San Antonio, Tx. 78213
May 8, 1986

Fred Nachbaur
Silicon Mtn. Computers
C-12, Mtn. Stn. Group Box
Nelson, BC V1l 5p1
Canada

Hi Fred!

I think I've finally got everything together and so enclosed find, 2 cassettes, drawings for the article on my AUTOSHIFTER, and a production circuit board, to use to reproduce full size patterns. (Keep the board when through with it, you may one day change your mind about an 80 key behemouth keyboard)
One cassette contains "ala MEMOTEXT" the assembly instructions, (quite simple) for the AS40, plus the "Theory of operation", plus the 2 "Table of commands" charts for use with the ZX81/1000 or the 2068. Use LAF AS40 to load it. Check with DSP for the exact titles of the 4 files. Within the "instruction" file, I have refered to Various Fig #?, without numbers since I didn't know how things would be layed out. The drawings are are also not numbered so that you may select them as you feel necessary. The "flip" side contains the operating instructions (slightly condensed), for TFO. If you wish to save it on your disc make the necessary changes at lines 9000 and on.

The other cassette contains a Blank TFO 64K version, set up for a "tape" save. If you haven't already found out, the program seems to be a little "touchy" about changing the "Basic" lines unless you keep the byte count the same as the original save. I'm enclosing a listing showing the changes I made to save to "AERCO" disc. The initializing command (RAND USR 12865) is given in the intermediate mode, and the name "ADISKA" is given the value of my selected page number, (14001) (64K format).
To "Break" out of TFO, select "V" from the main menu, then press "EDIT", then "STOP". Basic starts at Line 4000. To reenter GOTO USR R.
I really love this program for its flexibility. Theres almost nothing that you can't do with it. The only thing lacking, in my estimation is a "continuous" hard copy print out, like vufile.
On the flip side of this cassette is a copy of JOBASIC INC/EXP. This program was originally published in SYNTAX Nov 83 Vol 4, #11, by a J.R. Shoaf III. Since then I have expanded it considerably from the original, plus adding the JOBASIC. The program is quite simple to use and I use it for many sundry purposes. The thing is about 19K long and will handle 500 records. Please consider it for your "exchange program" library. I will forward the operating instructions as soon as I've modified them for the JOBASIC version. To check out the program, select (B) or (C) from the main menu and go!!

Thank you for the "FINAL ?" version of EPROM A, and as soon as I make my changes, in it goes. I, like you, will miss the "Line in error" feature, but thats life!

The "AERCO MEMOTEXT is great, but I already did a dumb thing. I wrote some documentation that was about 19K long, and saved it. Unfortunately thats too long for a single page in the AERCO system. When I reloaded it, the last portion, (about a page and a half), turned into "garbage". Being reluctant to retype 8 pages of this thing again, I thought of the "universal solvent" HOT Z, and proceeded to load what I had into it. It turns out the "END" marker was gone, and the Header Program length numbers were wrong. Refering back to your premier issue of "MEMONOTES" I made a quick fix and saved myself painful hours of retyping. THANKS AGAIN! The solution to the original problem of "saving" a long TEXT is to use "qit" and save from the intermediate mode using the 64K save command. This appears to be necessary whenever "DSP" shows you have less than about 5K memory remaining.

Anyhow if I can be of any help or you need any additional info on the "stuff" I,m sending, give a shout. Till then I remain

Sincerely

Pete

```
4000~LPRINT T$
4001 GOTO USR R
4010 LET T$=STR$ (VAL T$( TO VAL "14")/VAL T$(VAL "15" TO VAL "19"))

4011 GOTO USR R
4020 INPUT T$
4021 RAND USR ADISKA
4022 SLOW
4023 GOTO USR R
5000 INPUT T$
5001 GOTO USR R
```

Fred Nachbaur
C-12, Mtn. Stn. Group Box
Nelson, BC V1L 5P1

Canada

6 July 1986

Pete Petri
2186 Jackson Keller #433
San Antonio, TX 78213
U.S.A.

Dear Pete,

Sorry for the delay in answering your latest letter, and the AS40 article. I'm sure you know how it goes....

The auto-shifter board is really something! The article will make a nifty addition to either the magazine or the Journal; we'll decide which when I go back East to hash it all out with my partners, in a couple weeks. Meanwhile, my only thoughts at this time are as follows.

I couldn't get either of the LAF copies to load, even though I tried two different machines, signal conditioners, and head adjustment. The dropouts are simply too severe. It almost sounds like a bad mic-cable connection. I suspected customs X-raying, but the dropouts don't show the periodicity that normally results from this. So, I hope you have another copy on tape there. If not, could you try to load the tape you sent me, and if successful, please make me another tape.

I don't think it would be a good idea to print the actual board artwork. The reason is that it requires plated-through holes, a capability that few (if any) hardware experimenters will have at their disposal. There are several places where an IC terminal connects to both sides of the board, with no adjacent "pad" in which a feedthrough wire could be installed. I think it's a better idea to tell our readers to buy the board from you. So, if you will include your price in the article, you might glean a few sales from this.

However, I DO think that a full schematic would be required. Some guys might want to wire it up on perfboard, using wire-wrap. Though you sent the hook-up diagrams, a schematic was not included in the material you sent.

There's no big rush on this, as I mentioned I'll be out of town for several weeks starting the 19th of July, or thereabouts.

I was flabbergasted with the TFO version you sent, since it is the exact same version that I had already! Seems you had sent it to Tom Bent, who forwarded it to me! Small world, eh? I did some digging around in TFO, and so far the prospects of upgrading it to 64 columns for Oliger video are rather glum. This is mainly because of the way he writes directly to the display file, and also READS from the display file. I've been puzzling over the best approach in upgrading it, and any way I look at it, a major

rewrite would be required. The thing to do would be to set up a dummy display file, twice as big as the Sinclair one, and adjust all applicable pointers and CP limits. Then the task would be reduced to duplicating all WRITEs to both the dummy DF and also to the 64-column VRAM. All READs would have to reference the new dummy DF. Not a minor task, by any means. Not only that, but he has data (messages, etc.) scattered about his code "like empty beer cans," as Ray Kingsley would say. Maybe one day... but don't hold your breath.

I like your upgrade of INC/EXP. Very nice, indeed. As you probably know by now, I've included it in the JOBASIC Exchange. You will send me some documentation, right?

Glad you like the "FINAL ?" version of EPROM "A". The status has been upgraded to "FINAL !", since no-one has found anything wrong with it to date. By the way, here's something you can install in those nine unused bytes at 03C3:

```
LD HL,(EPPC)
CALL 09D8
LD B,H
LD C,L
RET
```

This is a "LINE_ADR" routine. LIST a BASIC line number, then PRINT USR 963. It will return the start address of that line; handy if you want to imbed machine-code in your BASIC. (I know it's a "no-no," but as far as I'm concerned, anything goes in ZX programming.) Also useful for installing exotic line numbers like A342, F000, etc.

Thanks for the tip on the Aerco SAVE problem with excessively long files. I'll update the documentation to include this, the next time I have to run some off.

Well, that should cover it for now. I'll be looking forward to a new AS40 Memotext tape, INC/EXP documentation, and anything else you care to toss my way. Till then, take care!

Regards,

Fred Nachbaur

Fred Nachbaur
C-12, Mtn. Stn. Group Box
Nelson, BC V1L 5P1
Canada

September 5, 1986

Dear Fred,

I've finally gotten finished with the "wiring diagram" for the AS/40 Autoswitcher. After a lot of drawing and sketching, I decided to abandon the idea of a FULL wiring diagram, since it became so complex that even I couldn't follow it. Instead I went with a modified wiring diagram of just ONE of the I.C.s since in essence they are all wired the same anyhow, except for the connections to the computer terminal pads, and the remote key solder pads.

The enclosed diagram shows the wiring for each of the 10 I.C.s, concerning the diode and resistor connections. The charts show the proper connections from each pin of each chip, to the various solder pad connections.

In reality this is the method I used when building my first prototype, which was a wire wrap version. It does however get just a little "MESSY" with all those wires running around, therefore the reason for designing the circuit board.

The connections as shown in the charts will match up to the "TABLE of COMMANDS" listing as I originally set them up. These of course could be changed as far as the physical layout is concerned.

Incidently, for those not wishing to use all 40 shiftable keys, one needs only to use just the connections desired for whatever shifted functions needed. However ALL the I.C.s must still be installed, regardless of how many shifted functions are going to be used.

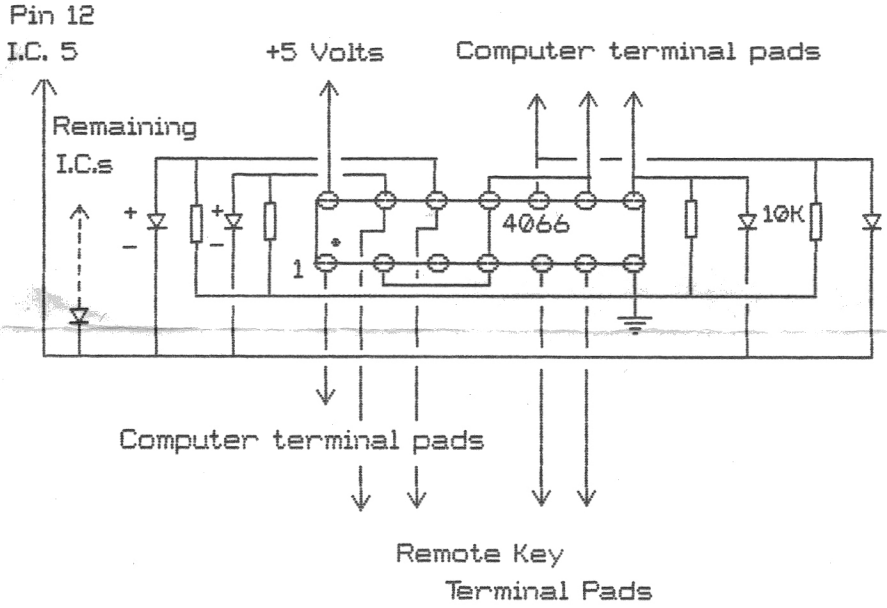
Hope this is satisfactory, and I'm looking forward to the publication of the JOURNAL. If you need any additional info, please let me know.

I Have incidently written to Peter McMullin in regards to the work he is doing on the JOBASIC screen dumps, and am anxiously awaiting word from him.

Sincerely,

Pete

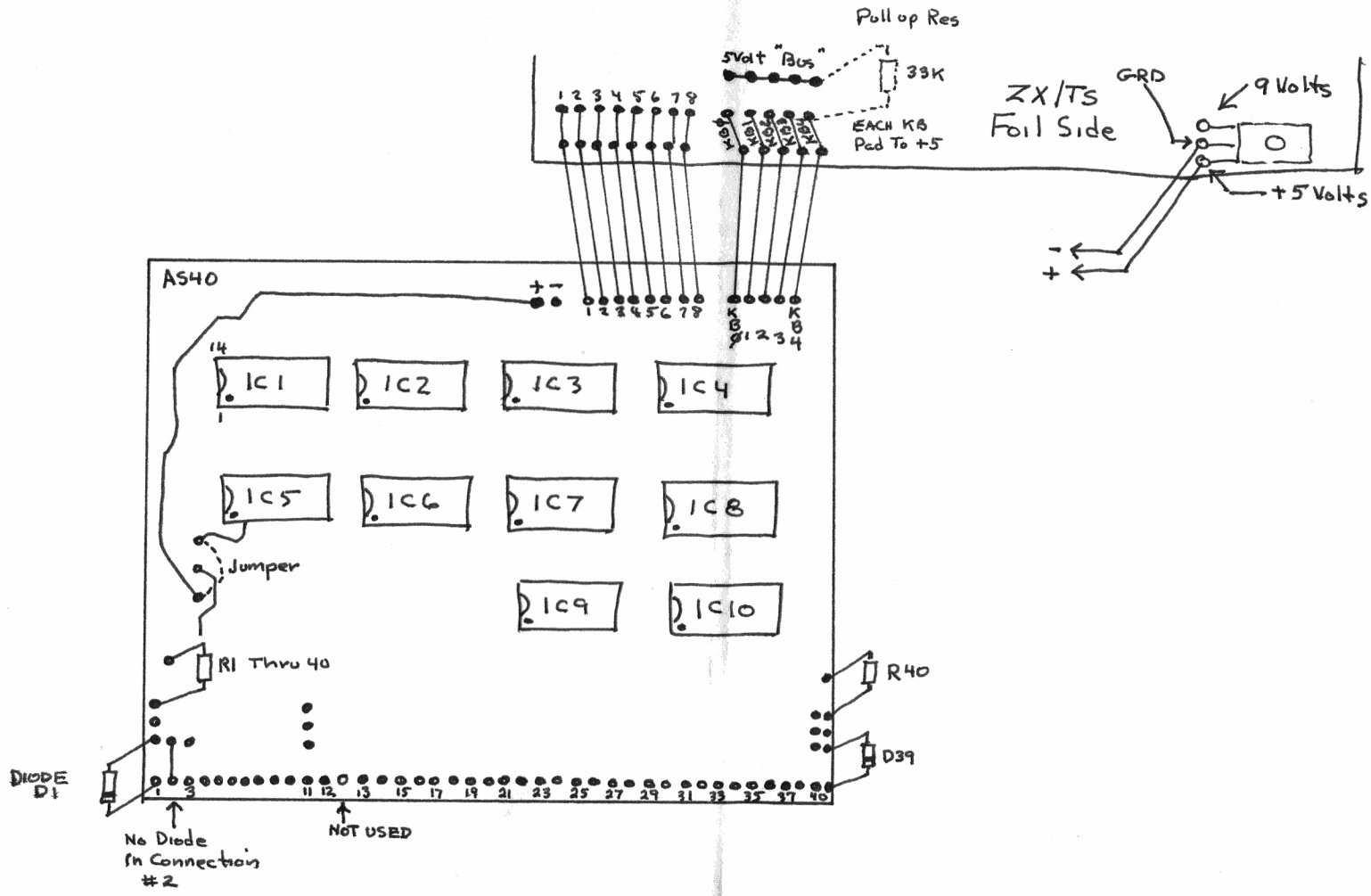
WIRING DIAGRAM FOR ALL I.C.s (1 - 10) A/S 40 Autoshifter

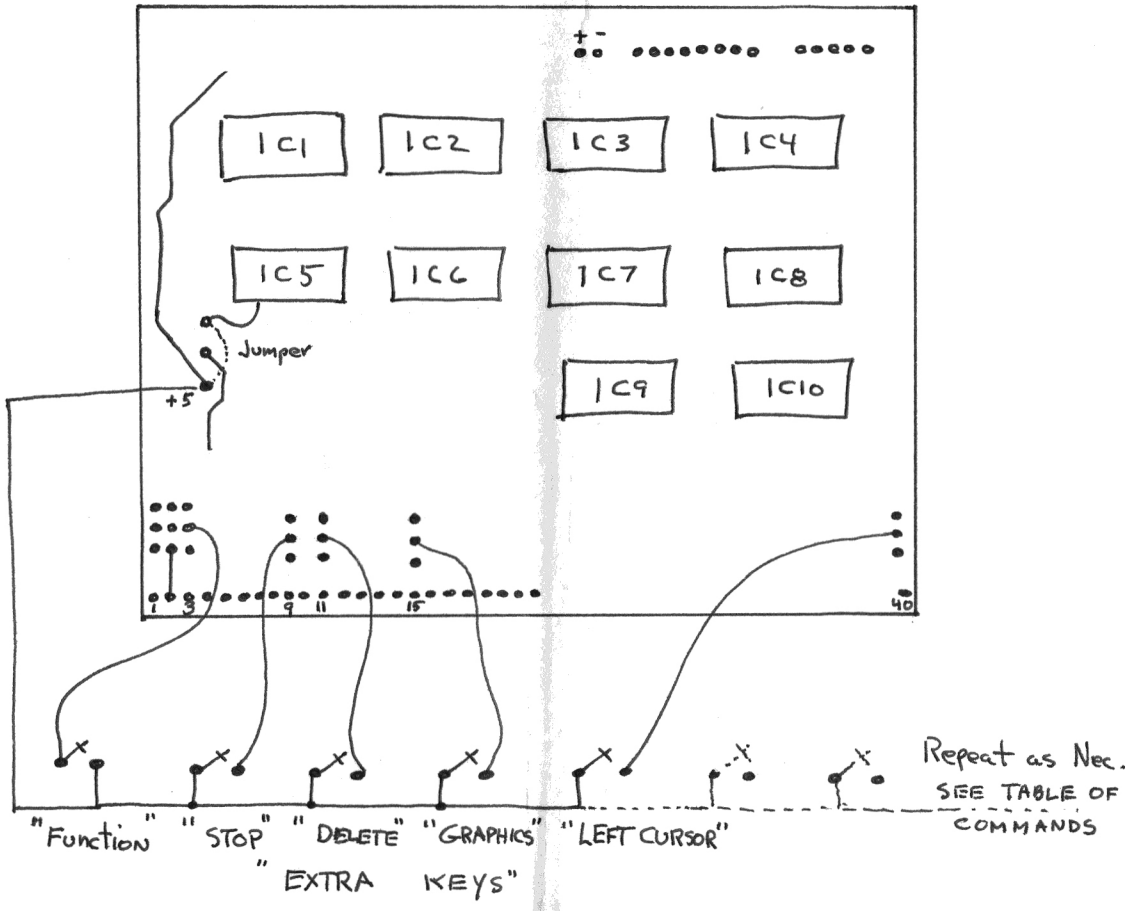


I.C. #	Pin #s	Computer Solder Pads
1,2	2,4,9,11	# 10
3,4	2,4,9,11	# 13
5,6	2,4,9,11	# 9
7,8	2,4,9,11	# 12
9,10	2,4,9,11	# 11
1,3,5,7,9	1	# 1
1,3,5,7,9	3	# 2
1,3,5,7,9	8	# 4
1,3,5,7,9	10	# 3
2,4,6,8,10	1	# 5
2,4,6,8,10	3	# 6
2,4,6,8,10	8	# 8
2,4,6,8,10	10	# 7
All I.C.s	Cathode End of Diodes connect to Common Bus	
All I.C.s	Pin 14 to +5 Volts	
All I.C.s	Pin 7 to ground	
All I.C.s	Pins 2,4,9,11 Tied Together	

I.C. #	Pin #s 5	6	12	13	Key Solder Pads
1	7	8	6	5	←
2	15	16	14	13	←
3	27	28	26	25	←
4	39	40	38	37	←
5	3	4	2	1	←
6	11	12	10	9	←
7	23	24	21	18	←
8	35	36	34	33	←
9	20	22	19	17	←
10	31	32	30	29	←

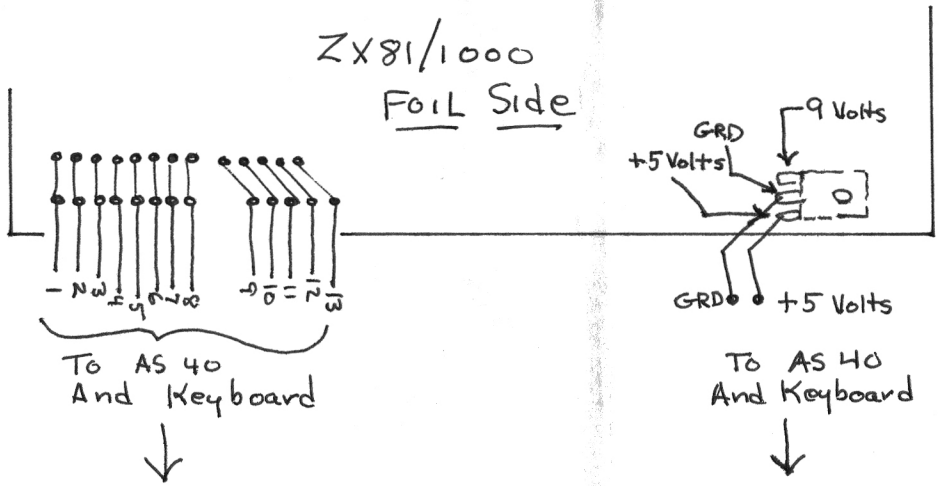
Petri Enterprises
2186 Jackson Keller # 433
San Antonio, Tx. 78212
(512)696-1109


Pull up Res
5Volt "Bus"
33K
1 2 3 4 5 6 7 8
KB 1
KB 2
KB 3
KB 4
EACH KB Pad To +5
ZX/TS
Foil Side
GRD
9 Volts
+5 Volts
-
+
AS40
+ -
1 2 3 4 5 6 7 8
KB 1 2 3 4
14
1
IC1
IC2
IC3
IC4
IC5
IC6
IC7
IC8
IC9
IC10
Jumper
R1 Thru 40
R40
D39
DIODE D1
1 3 11 12 13 15 17 19 21 23 25 27 29 31 33 35 37 40
No Diode In Connection #2
NOT USED


+ -
IC1
IC2
IC3
IC4
IC5
IC6
IC7
IC8
IC9
IC10
Jumper
+5
1
8
9
11
15
40
"Function"
"STOP"
"DELETE"
"GRAPHICS"
"LEFT CURSOR"
Repeat as Nec.
SEE TABLE OF COMMANDS
"EXTRA KEYS"

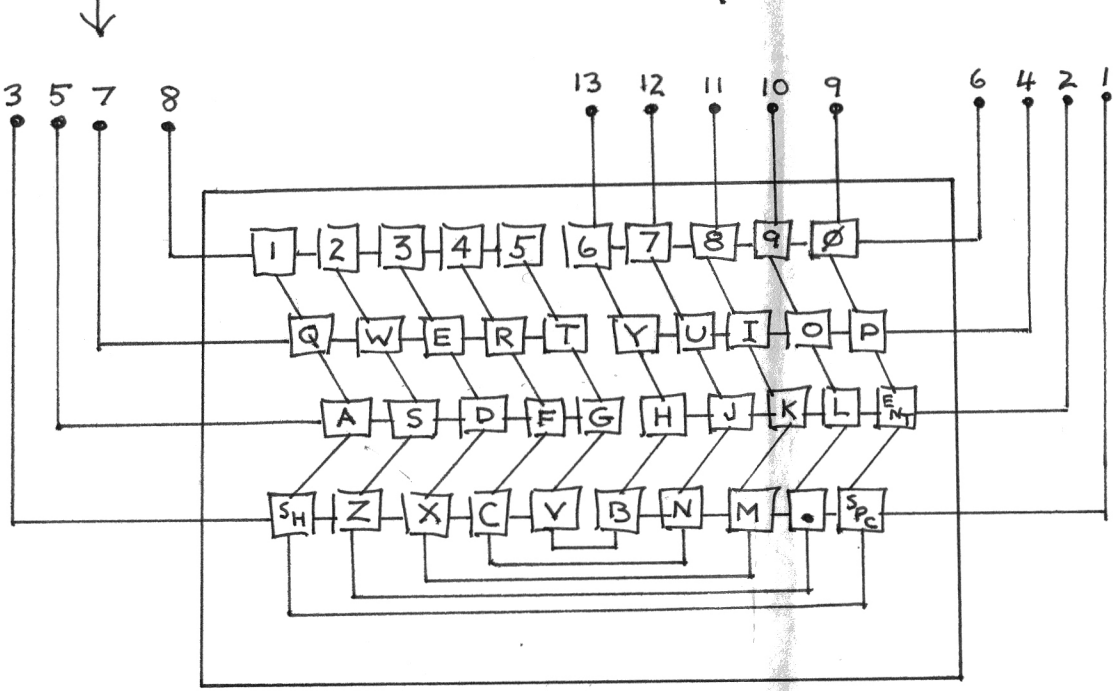
ZX81/1000

Foil Side



1- Connect AS40 To Keyboard with 16wire Ribbon Cable (Same numbers Together)

2- Connect AS40 / Keyboard To Computer (Same numbers Together)



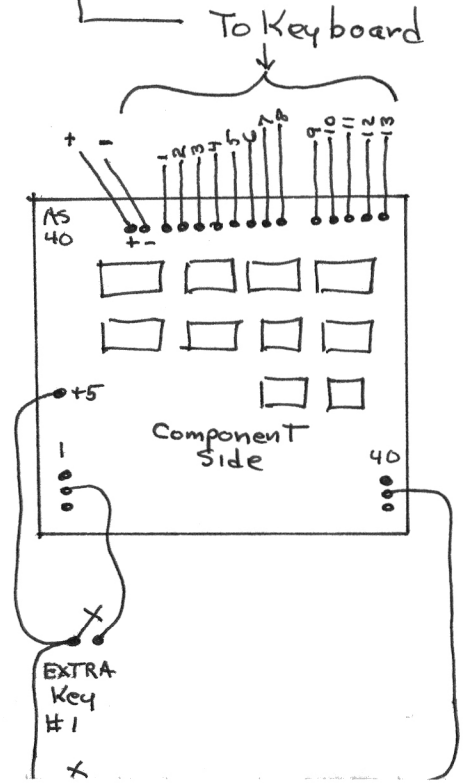


TABLE OF COMMANDS

FOR 2068

To get this	Connect extra key to pad no.
(BLANK)	1
shift	(NOT USED) 2
(BLANK)	3
"	4
(SYMBOL SHIFT)	(AUTOMATIC) 5
:	6
=	7
;	8
STOP	9
<=	10
(UNDERLINE)	11
!	12
NOT	13
<>	14
)	15
@	16
.	17
,	18
(ENG POUND)	19
+	20
?	21
AT	22
-	23
OR	24
*	25
/	26
**	27
AND	28
STEP	29
=>	30
(	31
#	32
TO	33
<	34
'	35
$	36
THEN	37
>	38
&	39
%	40

TABLE OF COMMANDS

FOR ZX81/1000

To get this	Connect extra key to pad no.
(ENG POUND)	1
shift	(AUTOMATIC) 2
FUNCTION	3
"	4
;	5
:	6
=	7
)	8
STOP	9
" "	10
DELETE	11
EDIT	12
LPRINT	13
OR	14
GRAPHICS	15
AND	16
>	17
<	18
;	19
+	20
?	21
(	22
-	23
$	24
*	25
/	26
**	27
=>	28
SLOW	29
STEP	30
→	31
THEN	32
FAST	33
<=	34
↑	35
TO	36
LLIST	37
<>	38
↓	39
←	40